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# Composite Studies of Atmospheric Cyclogenesis

## Based on Satellite Imagery

Semiannual Status Report

June 1986 - January 1987

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NASA Grant NAG 5-525

{NASA-CR-180116} COMPOSITE STUDIES OF  
ATMOSPHERIC CYCLOGENESIS BASED ON SATELLITE  
IMAGERY Semiannual Status Report, Jun. 1986  
- Jan. 1987 {Oklahoma Univ.} 3 p

N87-70310

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Three developments have occurred since last spring that have slowed down research progress on NASA NAG 5-525: (i) The budget was reduced 50% which drastically curtailed some of the planned activities for 1986-87. The most major effect was the inability to bring in a second graduate student to begin diagnostic studies of the cyclone composites. (ii) Shortly after recruitment was halted for a second student, the first student associated with the grant transferred to another university for personal reasons having nothing to do with the project. This left the project without any student support for a few months until a new student from the Peoples Republic of China started at the University of Oklahoma this fall. (iii) The principal investigator began his sabbatical year in July 1986 and will return in July 1987. This would not normally have precluded working with the O.U. students on the research, but since the only student was beginning his first semester of studies in the U.S., the only activities that were carried out involved literature review, familiarization with the research carried out by the first student, learning computer systems, and practicing computations on a previously-analyzed case study. After one semester, this student seems to be doing well and is rapidly becoming well-versed in satellite meteorology and cyclogenesis.

Progress has been made on deciding on the procedure to generate the three-dimensional data volumes from which the composites will be extracted. Since none of the NMC operational analyses have resolution finer than  $2^{\circ}$  by  $1\text{-}1/2^{\circ}$ , we have decided to use the isentropic analysis procedure of Peterson (1986 *Mon. Wea. Rev.*, p. 719) to generate high-resolution ( $1^{\circ}$  by  $1^{\circ}$ ) analyses over the continental U.S. using the original rawinsonde reports. This will also yield higher vertical resolution if we select, e.g., a  $2^{\circ}\text{C}$  interval between analysis levels, especially in the important baroclinic zones. These analysis volumes will be produced for

each of the cases (which have already been selected) and our proposed compositing procedure will be done both in isentropic space and from pressure coordinate data interpolated from the analyses.

The analyses will be produced at NMC this summer. The aforementioned graduate student will visit NMC and work with Ralph Peterson on adapting his analysis procedure. Since NMC has a two-year archive of original data, the analyses will be produced there, put on tape and brought back to O.U. for compositing. The remainder of the research will still follow the objectives outlined in our original proposal and in the Request for Second Year Funds written May 27, 1986. The reduced budget, though, will result in a slower work pace than originally planned, and I expect that there will be further requests made for extensions in the time needed to complete the project.